CITY OF BURLINGTON

PHASE II STORMWATER 2007 ANNUAL REPORT

General Permit #3-9014
NPDES Permit #VTR040000

Submitted by:
Burlington Public Works

April 2008

A. INTRODUCTION

This report is being submitted as part of the City of Burlington's Phase II Stormwater Plan per the NPDES (National Pollution Discharge Elimination System) requirements. It follows the same format used in previous years and includes the following information as discussed in Section H of the city's plan:

- Status of compliance with permit conditions.
- Results of information collected.
- A summary of stormwater activities planned for the next annual cycle.
- Any proposed changes as outlined in Section F of the stormwater plan.
- If applicable, provide notice as to whether or not another entity is responsible for any of the permit obligations.

It is important to note that Mayor Kiss formed a Stormwater Task Force that has been actively addressing regulatory, technical and budgetary issues associated with stormwater in Burlington for over one year. This Task Force is comprised of city officials from the Code Enforcement, Community & Economic Development, Planning & Zoning, and Public Works Departments as well as community members from the Burlington Conservation Board and representatives from the Vermont League of Cities & Towns.

B. STATUS OF COMPLIANCE WITH PERMIT CONDITIONS AND INFORMATION RESULTS

This section will outline the tasks proposed in the original stormwater Phase II plan, the status of compliance with the plan, and applicable results. Each of these tasks are arranged in accordance with the required six minimum control measures.

1. Public Education/Outreach Program

The City of Burlington continues to be a participant in the Chittenden County Regional Stormwater Education Program (RSEP) in accordance with section E1 of the stormwater plan.

RSEP continued its work on a public education and outreach campaign. The multifaceted campaign included both paid and unpaid media, with an overall goal of increasing awareness and understanding of stormwater runoff pollution, prevention methods, and the connection between stormwater runoff and water quality. Marketing Partners, Inc. continues to work on contract with RSEP on this campaign.

During the 2007 calendar year, Marketing Partners primarily focused their efforts on paid media spots in print, television and radio. Appendix A contains both their 2007 and Five-Year program summary. Finally, a post-campaign survey was completed in October 2007 and the summary is included in its' entirety in Appendix A.

2. Public Involvement/Participation

On May 5, 2007 the Community and Economic Development Office (CEDO) once again played a key role in sponsoring Green Up Day in Burlington. A total of over 900 volunteers collected 535 bags of garbage, removed graffiti and groomed the greenbelts that entailed raking debris and leaves. As you can see from the photos in Appendix B, CEDO continues to makes Green Up fun!

Like in previous years the Englesby Brook watershed was also targeted on Green Up Day for trash removal. Debris sites in Englesby were mapped ahead of time by Public Works and a handful of volunteers were sent to different areas of the watershed. The Parks Department later collected all the trash, which included paper and plastic, metals, tires and shopping carts that had been dumped into the brook. The total volume of debris collected amounted to 2 small dump truck loads.

Stormwater workshops were held at Neighborhood Planning Assembly (NPA) meetings in December of 2007 with an objective of showing folks the types of practices we all can do to reduce stormwater pollution. A PowerPoint presentation included screenshots from the RSEP website www.smartwaterways.org that shows people how to minimize pollution from outdoors activities such as car washing, lawn fertilization, soil disturbance and management of pet wastes. This presentation also included how to reduce watershed connected impervious area by redirecting roof gutter flow whenever possible from driveways to lawns. The second half of this presentation included a discussion about rain barrels and rain gardens by a representative from the University of Vermont Extension Service. Based upon the types of questions asked, it appeared that at least some of the participants were genuinely interested in becoming stewards of the environment. Since we could not get on everyone's agenda in late fall a few more workshops are planned in 2008.

3. Illicit Discharge and Elimination

An illicit discharge monitoring program was initiated in 2004 in accordance with the Phase II plan. All of the stormwater outfalls mapped in 2003 were visited in 2007 and were sampled whenever possible. In order to look for direct or indirect wastewater discharges into stormwater systems, grab samples for *E. Coli* bacteria were taken on those outfalls that had dry weather flow and pads for optical brightener (OB) testing were placed in all outfalls. The optical brightener test is a low cost procedure that detects fluorescent white dyes added to nearly all the laundry detergents to whiten cotton fabrics without the use of chlorine bleach. These dyes fluoresce in the blue region of the visible spectrum when exposed to longwave ultraviolet (UV) light. Unbleached cotton pads are placed in stormwater outfalls where they continuously sample flow and absorb traces of this dye, if present, for the period of time they are in service, usually 1 to 2 weeks. The pads are removed, dried and then viewed under a UV lamp. Pads from stormwater outfalls that fluoresce more than the control pad would indicate a possible direct or indirect contamination from wastewater. More information can be found on this procedure at: http://www.naturecompass.org/8tb/sampling/. Appendix C at the end of this document shows the outfall locations along with discharge monitoring reports for sampled outfalls in a format approved by the Vermont Department of Environmental Conservation (VTDEC).

The Englesby Brook O8 pond was sampled multiple times during rainfall events along with upstream and downstream locations to determine bacteria concentrations at discrete points in time. These results are included with the outfall discharge monitoring reports.

In September we received a telephone call from a resident who reported seeing a man dumping liquid into a catch basin at the end of Central Avenue adjacent to Englesby Brook. Unfortunately this resident did not get a license plate number. We grabbed a sample from this basin which was colorless and odorless, ran a pH and dilutions of this sample with bacteria spikes to see if the material dumped was potentially toxic. The pH was almost neutral (6.82 pH units) and the trial toxicity results were inconclusive. We

advised the resident to write down a vehicle plate number if she witnesses a dumping again.

The Alexis Drive outfall that historically had high bacteria counts was corrected when the original developer, without seeking approvals, filled in the stormwater detention area to correct a flooding problem on his property. During this work, the contractor found and corrected a leaking sewer pipe that ran adjacent to this area. Subsequent sampling in late 2007 revealed no bacteria or optical brightener detected. Since this detention area is part of a permitted stormwater system (permit 4380-9010), the City and State are requiring this landowner to construct in 2008 a new system with treatment capabilities at least equivalent to the original system.

High bacteria counts showed up in the Appletree MS4 in December of 2007. No optical brighteners were picked up in pads near the outfall into Lake Champlain. We suspended sampling over the winter due to frozen swales, but will continue our work in the spring.

An illicit connection to the Plattsburgh Avenue outfall that was corrected in 2004 has recently tested positive again for bacteria and optical brightener in December. We had done follow-up bacteria work in 2004 after a house sewer was removed and had believed that there was only one illicit connection on this stormwater system. As of the time of this writing, we have located another house connection on Turf Road and are working with the property owner to correct as quickly as possible. Our video camera has not picked up any more connections.

State LCIF funds were used to purchase a camera that allows us to inspect stormwater and other pipes for illicit connections, structural integrity, etc. This camera is lowered into a manhole and with a zoom ratio of 216:1 it has the potential to see one hundred feet or more in each direction. This camera is currently being used in conjunction with bacteria and OB testing to help find the problem(s) on our Plattsburgh Avenue MS4.

4. Construction Site Stormwater Runoff Control

It is the opinion of the city that erosion is generated by all projects that disturb soils and that construction site erosion can be controlled in all cases. An erosion and sediment control checklist was submitted for review in the 2004 Annual Report, and has been modified over the years.

Late in 2007 the City Council adopted a comprehensive zoning rewrite that includes a section on stormwater management for projects that increase impervious surface or disturbed area by more than 400 square feet. This stormwater section includes requirements for the applicant to submit an Erosion Prevention Sediment Control (EPSC) Plan that shall include means and methods to control sediment on construction sites and prevent it from migrating offsite. Appendix D includes the final zoning ordinance Section 5.5.3 pertaining to stormwater.

The VTDEC has requested that the city provide a list of projects under construction in 2007 that met the one acre impervious and the new one acre disturbed area thresholds for state permitting requirements. According to the Department of Planning and Zoning, no new projects that met these limits started construction in 2007.

5. Post-Construction Stormwater Management in New Development and Redevelopment

Our permit plan included recommendations that all developments and redevelopments at least attempt to meet standards set forth in the 2002 VTDEC Stormwater Management Manuals, and have the city create a requirement that all projects disturbing one acre or more of land conform to these standards. These requirements were informally started in 2003. Through the Technical Review Committee process, Public Works has been able to add this condition to projects. Those projects that have structural treatment systems are also required to provide an operation and maintenance (O&M) plan for their system.

The City's adopted Comprehensive Development Ordinance on Stormwater and Erosion Control standards mentioned in the previous section and in Appendix D, includes requirements for a Stormwater Management Plan. This plan shall include the creation of a formal maintenance covenant that outlines inspection schedules as well as documenting responsible parties for said maintenance activities.

6. Pollution Prevention and Good Housekeeping for Municipal Operations

In August 2006, the State of Vermont issued their requirements for a Multi-Sector General Permit. The MSGP is a federally mandated National Pollutant Discharge Elimination System (NPDES) permit that covers new and existing discharges of stormwater from industrial facilities. Many of these facilities conduct activities and use materials that have the potential to impact the quality of Vermont's waters. This permit requires facilities to examine potential sources of pollution, implement measures to reduce the risk of stormwater contamination, and test stormwater discharges for sources of pollution. In Vermont, the Department of Environmental Conservation is the permitting authority and administers the MSGP. Permit coverage is required by private and municipal industries identified on the MSGP Standard Industrial Classification (SIC) code list. More information on the MSGP can be obtained from the State's website at: http://www.anr.state.vt.us/dec/waterq/stormwater/htm/sw_msgp.htm

The city has already been approved for No Exposure certifications for its three (3) wastewater treatment facilities since all equipment and materials are protected from precipitation. We will shortly be filing for No Exposure certifications for Burlington's two (2) closed landfills since they were capped in accordance with State-approved closure plans and are being monitored as required.

According to the FAQ section of the State's website, municipal garages are exempt from filing for MSGPs. However, the city realizes that these garages can be sources of stormwater pollution. We will be performing an internal audit to see where we can reduce our impact to the environment.

A system for the inspection, cleaning and repair of catch basins continued in Burlington. According to the right-of-way group in Public Works, in 2007 there were 65 basins and 40 manholes rebuilt, and 400 basins cleaned with 120 tons of sediment removed.

All city streets were swept a minimum of 6 times in 2007 with an estimated 150 tons of sediment removed.

In addition to the zoom camera mentioned above, state LCIF funds were used in 2007 to purchase erosion control materials for Public Works' Water Distribution and Right-of-

Way crews. This material list included silt fencing, straw blankets, catch basin insert filters and a filter bag for treating pump discharges.

C. ACTIVITIES PLANNED FOR THE CURRENT ANNUAL CYCLE
All activities starting in 2008 shall be in accordance with the new five year permit cycle.

D. PROPOSED CHANGES TO THE STORMWATER PLAN OR TIMELINE
All activities starting in 2008 shall be in accordance with the new five year permit cycle.

E. CHANGE IN RESPONSIBILITY FOR PERMIT OBLIGATIONS
All activities starting in 2008 shall be in accordance with the new five year permit cycle.

F. CERTIFICATION
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ _____
Steven Goodkind, P.E. Director of Public Works Date Signed

APPENDIX A – REGIONAL STORMWATER EDUCATIONAL PROGRAM 2007

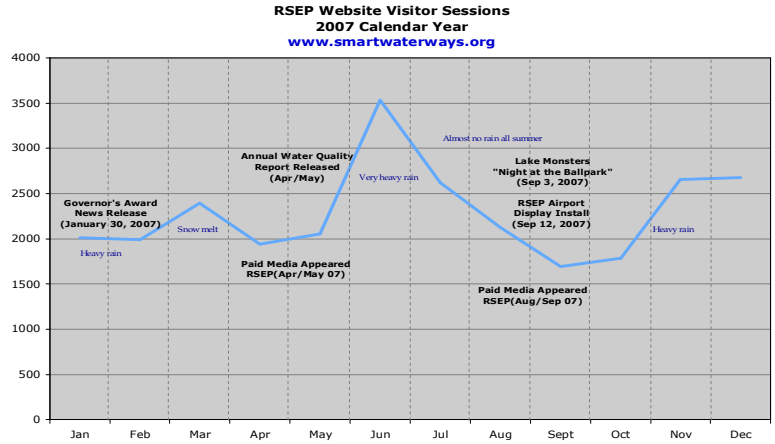
Regional Stormwater Educational Program - 2007 Calendar Year Recap

During 2007, RSEP continued its work on a public education and outreach campaign. The multifaceted campaign included both paid and unpaid media, with an overall goal of increasing awareness and understanding of stormwater runoff pollution, prevention methods, and the connection between stormwater runoff and water quality. Marketing Partners, Inc. continues to work on contract with RSEP on the public outreach campaign.

During the 2007 calendar year, RSEP accomplished various goals outlined in the Communication Plans for Program Years 2005-6 and 2007-8. The accomplishments include:

- Post-campaign survey assessment and presentation of key findings.
- Enhanced outreach efforts by producing a custom educational display for installation at the Burlington International Airport.
- Developed a portable display for shared municipality use at educational fairs and other events.
- Planned and scheduled sponsorship of Lake Monsters Night at the Ballpark on September 3, 2007. The package included 40 on air promotional announcements prior to the game; live reads to the fans during the game; table, banner and mini beach ball give-away at Centennial Field entrance; 60 commercials to air on CHAMP (WCPV) prior to game night; 60 commercials online on (SWCPV) prior to 9/30/07; additional one commercial at each game for the 2007 season; web address on stadium sponsorship sign and a link exchange from RSEP's site to CHAMP's website.
- Made updates to the website including adding the 2007 Vermont Congressional Delegation presentation to the Problems and Solutions page.
- Conducted a paid media campaign throughout Chittenden County in spring 2007 that included 2 weeks of print ads in nine community papers, three weeks of spots airing on two of the top radio stations, three weeks of highly targeted broadcast television and a three week schedule of cable television.
- Conducted a fall 2007 campaign of an additional three weeks of print, three weeks of radio, three weeks of broadcast and three weeks of cable television, which completed the 2007 campaign.
- Compiled website and other media visibility tracking data in order to monitor outreach effectiveness.
- Continued to collaborate with partners, such as the Governor's Clean & Clear Action Plan and public school officials, in furthering stormwater education outreach.

Below is the website impression information for 2007. Website traffic increases are marked in conjunction with paid and unpaid media.



Chittenden County Regional Stormwater Educational Program
Five-Year Program Summary: 2003 – 2008*

Over the Five-Year Program (March 10, 2003 - March 9, 2008*) RSEP developed, expanded and refined a toolbox of materials for public education and outreach. The multifaceted campaign used both paid and unpaid media to educate the public bout the effects of stormwater runoff on water bodies and simple steps that the public can take to reduce these effects. Key messages included stormwater runoff and stormwater systems, tips on prevention methods related to pet waste, car washing, fertilizer/chemicals, and home construction erosion or debris. Marketing Partners, Inc. worked on contract with RSEP to implement the public outreach for the five-year campaign.

The RSEP Program identified long-term program objectives, identified messaging and accomplished goals outlined in each of the annual Communication Plans, including:

- In year one produced five television spots, five radio spots, five print ads and fact sheets.
- Identified the need for and developed a website which was enhanced annually by:
    - Creating an interactive animation ("Stormville") to illustrate the RSEP key messages. Of note, municipalities from across the country requested copies of "Stormville" to add to their own websites.
    - Developing "Science Viewer" to existing Stormville animation, adding more depth and scientific explanation to the content in Stormville. "Science Viewer" content was designed to reach a teen/young adult audience segment with RSEP's 5 key messages.
    - Adding content pages for educators and middle-school students.
- Developed a five-minute video on stormwater and organized a comprehensive one-hour stormwater panel discussion on Vermont Public Television.
- Developed promotional items included a refrigerator magnet, a bookmark and a mini beach ball.
- Increasing visibility on stormwater runoff throughout Vermont by partnering with Governor James Douglas' Clean & Clear Action Plan 2003-2006 (Clean & Clear did not run a campaign in 2007).
- Used PR opportunities to earn unpaid media visibility such as results of the 2003 survey, rainy weather, or beach closings when possible.
- Developed and conducted a paid media campaign throughout Chittenden County which included highly targeted cable television, community newspapers and top rated radio stations each year. Findings concluded that adding broadcast television in summer and fall, supported by PR in the summer months increased website traffic. In year four and five, broadcast television was incorporated in order to gain greater reach among the target audiences.
- Reviewed objectives each year using the previous year's historical data to make refinements in the following year.

* *As of November 30, 2007*

RSEP Gross Impressions/ Audience Reach

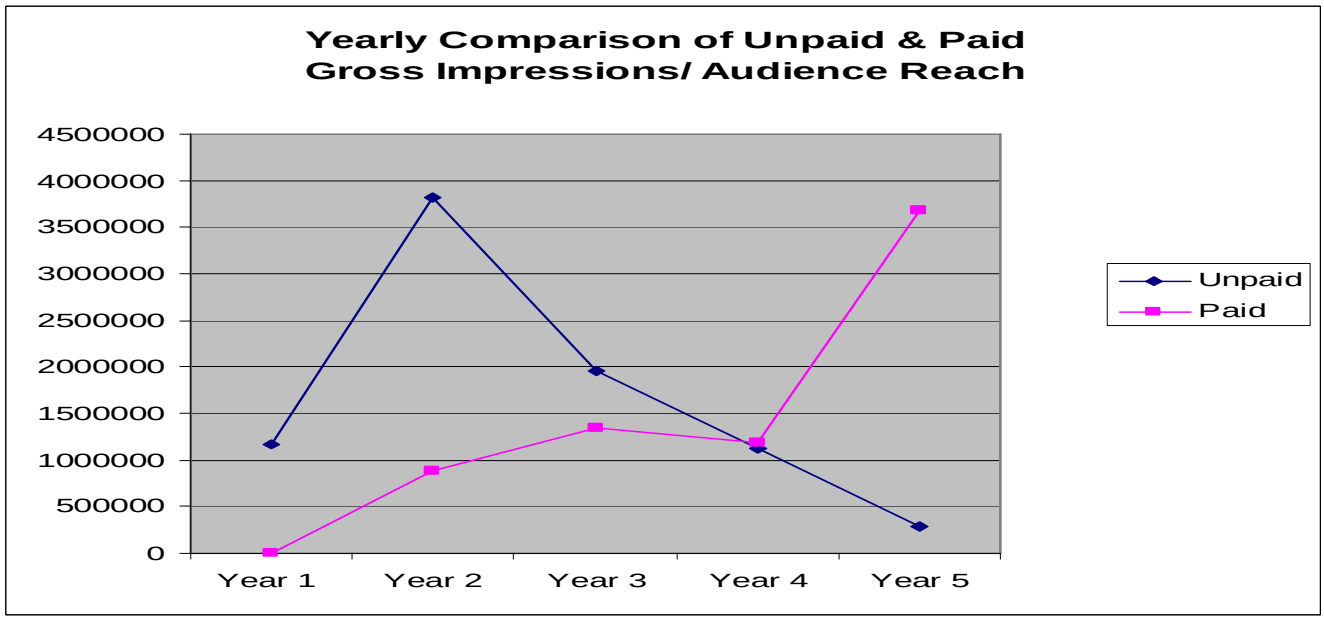
1. **Unpaid Media (Public Relations)**
   Key Finding: Impressions from unpaid media have declined steadily after Marketing Partners initial donations of public relations services on a pro-bono basis.

Table 1: Unpaid Media Visibility based on Yearly Impressions *					
	Year 1	Year 2	Year 3	Year 4	Year 5
Print:	777,700	838,900	583,690	250,869	94,590
Online:	123,000	2,566,352	889,008	446,504	148,168
TV:	275,000	369,000	139,000	369,000	0
Radio:	0	0	300,000	0	0
Insert:	0	47,000	47,000	47,000	47,000
TOTALS:	**1,175,700**	**3,821,252**	**1,958,698**	**1,113,373**	**289,758**
Notes:	**1.)** All public relations efforts donated by Marketing Partners, Inc. **2.)** Stormwater survey results publicity on WCAX Ch 3. **3.)** Four-part stormwater series in Burlington Free Press.	**1.)** All public relations efforts donated by Marketing Partners, Inc. **2.)** Publicity around Smart Water Ways website launch. **3.)** Three-part WCAX Ch 3 Stormwater & Lake Champlain Basin series.	**1.)** After the storm: Stormwater in VT panel discussion on Vermont Public Television.	**1.)** Three-part WCAX Ch 3 Stormwater series. **2.)** Three-part Burlington Free Press Stormwater series. **3.)** RSEP Governor's Award publicity.	**1.)** Media outreach for program year five was focused on paid media with no news releases being sent to media. **2.)** Airport display was installed in Burlington International Airport.

2. **Paid Media (Advertising)**
   Key Finding: Whenever additional money has been made available to the program, advertising impressions from paid media have increased.

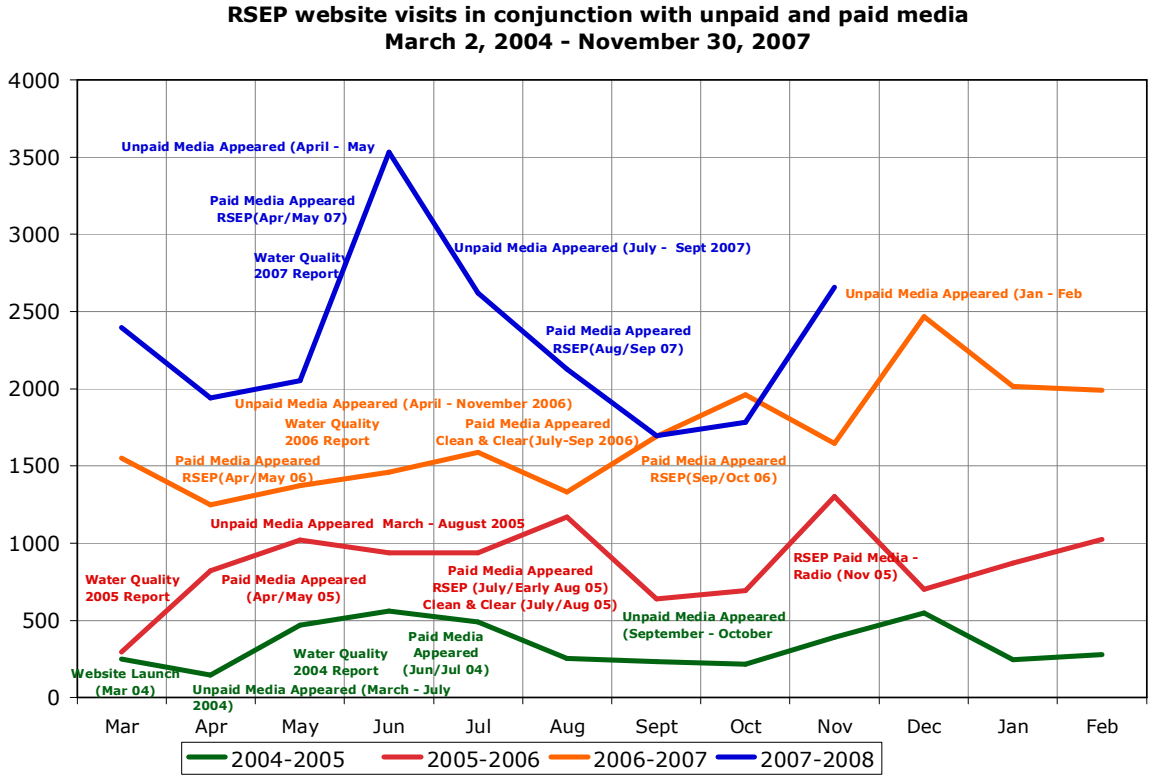
Table 2: Paid Media Visibility based on Yearly Impressions *					
	Year 1	Year 2	Year 3	Year 4	Year 5
Print:	0	204,700	363,800	331,000	501,500
TV:	0	484,800	682,446	665,500	2,960,640
Radio:	0	199,500	300,900	186,300	214,800
TOTALS:	**0**	**889,000**	**1,347,146**	**1,182,800**	**3,676,940**
Notes:	**1.)** Ads being developed for spring 2004.	**1.)** First program year running ads.	**1.)** RSEP received 301B grant.		**1.)** $20,000 more for media buy allowed number of purchased spots to double.

(* Impressions represent the total number of times a spot is potentially heard/seen, not the number of actual persons who hear/see it. Print impressions are based on circulation reported by media outlet. Online impressions are based on monthly visits reported by media outlet and have been decreased to reflect an updated audited online and visitor number for the Burlington Free Press. *In 2005-2006, the BFP used 1,300,000; in late 2006 Nielsen Net Ratings audited and showed 148,000.* TV impressions are based on number of households reported by media outlet. Radio impressions are based on number of listeners age 12+ Mon-Fri. 6 a.m. to midnight. Insert impressions are based on number reported by the Champlain Water District.)



3. Website

Key Finding: Monthly Smart Water Ways website traffic has increased significantly every program year.



Creating Smarter Water Ways?

Findings from a post-campaign survey

Research objective

- The objective of the RSEP *post-campaign* survey was to determine the prevalence of storm water knowledge, attitudes, and behaviors after the media intervention with the target audience — residents of Chittenden County, Vermont.
- The post-campaign telephone survey was conducted by the UVM Center for Rural Studies between October 8 and October 12, 2007. For results based on the 454 completed surveys, one can say with 95 percent confidence that the error attributable to sampling and other random effects is plus or minus five percentage points.
- Comparisons for statistical significance were made to the 2003 pre-campaign survey designed by the Lake Champlain Committee and conducted by Macro International.
- It should be noted that changes were made to the 2007 study, including a slightly different introduction and a change in the order of the questions from behavior-opinion-demographics (2003) to opinion-behavior-demographics (2007).

Respondent Profile

		Pre-campaign (2003)		Post-campaign (2007)		+/ –
Home Ownership:	Own Rent		78.7% 20.7%		84.4% 15.3%	+
Age:	Under 20 21-45 46-60 Over 60 Don't Known/Refused	8 192 116 84	2% 48% 29% 21%			
	Some high school High school graduate Some college Two year college Four year college Graduate level					

Respondents by Municipality

		Pre-campaign (2003)		Post-campaign (2007)	
Respondents by Municipality:	Burlington	136	34.0%	131	28.9%
	Colchester	50	12.5%	56	12.3%
	Essex Junction	10	2.5%	46	10.1%
	Essex Town	66	16.5%	59	13.0%
	*Milton**	N/A	N/A	34	7.5%
	South Burlington	57	14.3%	57	12.6%
	Shelburne	23	5.8%	26	5.7%
	Williston	39	9.7%	26	5.7%
	Winooski	19	4.7%	19	4.2%
	TOTAL	**400**		**454**	

*Milton was not one of the original Chittenden County MS4s therefore, they were not included in the 2003 survey.

5 Problems Targeted for Media Campaign

- Stormwater knowledge gap
- Pet waste
- Car washing on pavement
- Erosion around homes
- Fertilizers & chemicals

Problem — Solution Messages

- For each of the five targeted issues, a problem statement was developed, and a corresponding behavior or knowledge solution was promoted throughout the media campaign.
- A comparison of survey responses in 2003 to responses to the same five questions in 2007 will be one indicator of the effectiveness of the media campaign intervention.

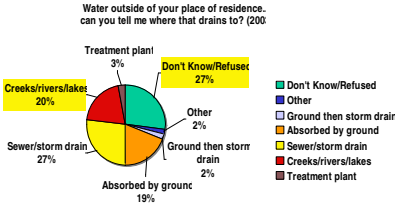
The Stormwater Knowledge Gap

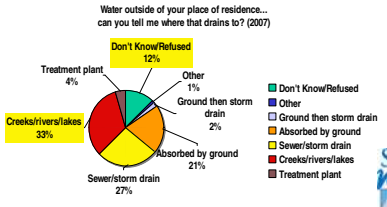
- Many people don't realize that stormwater runs directly into our waterways and is not treated in the sewage system
- People don't know that stormwater runoff picks up pollutants and carries it into our waterways
- Many people don't understand the link between stormwater runoff and the water quality in our local streams and Lake Champlain
- Many people don't realize they can help improve water quality by making simple changes to their daily behaviors

Where Does Storm Water Go?

Knowledge about stormwater and where it goes has shown a statistically significant improvement.

- The number of people who understand that storm water discharges directly into waterways has increased from one out of five (20%) in 2003 to one out of three (33%) in 2007.
- The number of people who have no idea where storm water goes has decreased from 27% in 2003 to 12% in 2007.





*Note. Chi² test indicates a **significant** difference between 2003 and 2007*

Pet Waste

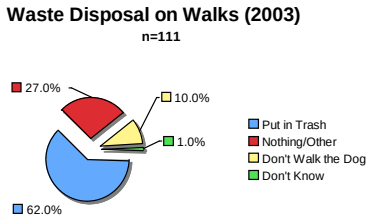
The Problem

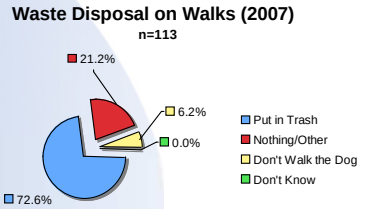
- Pet waste that isn't picked up adds bacteria and nutrients into stormwater runoff
- Children can get sick
- Beaches can be closed because of high bacteria levels
- Excess nutrients can cause algae blooms

Pet Waste — What You Can Do

- Pick up animal waste in your yard and when walking your pet; don't leave it behind.
- Dispose of it properly in the trash or by flushing.

Pet Waste on Walks

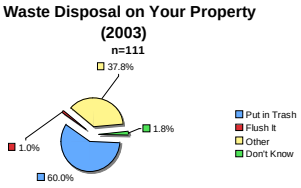


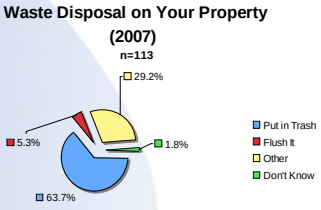


- Nearly three-quarters (72.6%) of 2007 respondents indicated that they throw their pet waste in the trash when walking their dog compared with less than two-thirds (62.0%) in 2003.
- This represents a positive trend in knowledge about pet waste and its effect on local lakes, rivers, creeks, streams, etc.

Note. Chi² test indicates a significant difference between 2003 and 2007

Pet Waste on Your Property





- Those who dispose of pet waste properly at home, either in the trash or by flushing, increased from 61% in 2003 to 69% in 2007.
- Although not a statistically significant difference, this represents a positive trend in knowledge about pet waste and its effect on local lakes, rivers, creeks, streams, etc.

Car Washing

The Problem

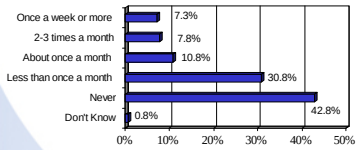
- Oil, grease and other toxins flow untreated into our storm drains and streams.
- Even biodegradable soap can be toxic to fish and wildlife. Fish can become contaminated and die.
- Land animals and people can become sick and die from eating diseased fish or ingesting polluted water.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.

Car Washing — What You Can Do

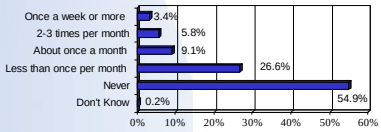
- Avoid hosing down paved surfaces or washing your car in the driveway or street.
- At home, wash car on a lawn or unpaved area so runoff can be absorbed. Use non-toxic soap.
- Use a commercial car wash.

Frequency of Car Washing at Home

How often, if at all, did you or people in your household wash your cars at home? (2003) n=400



How often, if at all, did you or people i your household wash your cars at home? (2007) n=417



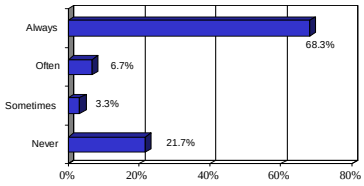
Note. Chi² test indicates a significant difference between 2003 and 2007

- The percentage of respondents that no longer wash their car at home has increased from slightly less than half (43%) in 2003 to over half (55%) in 2007.
- This is seen as a positive trend although neither the 2003 nor 2007 survey indicate if these people are washing their cars at a commercial car wash or simply not washing their cars.

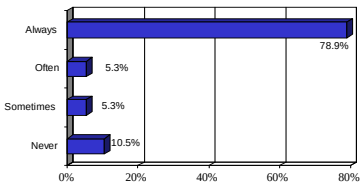
Car Washing on Paved Surfaces

- An increase was reported in the number of respondents who always wash their cars on paved surfaces. However, this question was asked of only a small number of respondents (in 2007 less than 10%) and is not seen as a significant finding.

How often were they washed on paved surfaces? (2003) n=60



How often were they washed on paved surfaces? (2007) n=38



Erosion

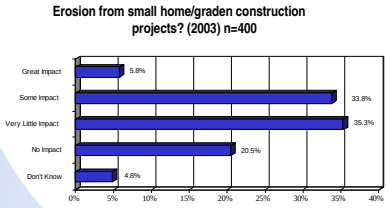
The Problem

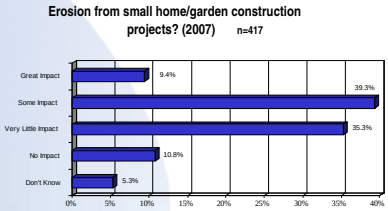
- Soil that accumulates in streams slows water flow and causes backups
- Localized flooding and polluted standing water damages homes and breed mosquitoes
- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow
- Sediment can destroy aquatic habitats

Erosion — What You Can Do

- Bank or berm around home construction projects to prevent erosion and sediment from clogging steams, stormwater catch basins and stormwater drains
- Plant a rain garden
- Use a rain barrel

The impact of erosion from small home/garden construction projects)

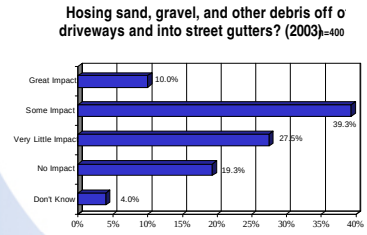


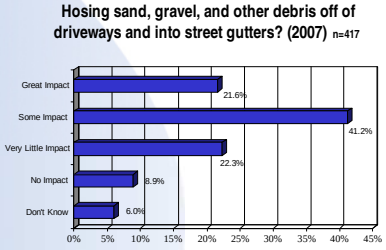


- The percent of respondents who understand the impact (great or some) of erosion from small home/garden construction projects increased from just 4 out of 10 (39.6%) in 2003 to nearly 1 out of 2 respondents (48.7%) in 2007.

Note. Chi² test indicates a significant difference between 2003 and 2007

The Impact of Hosing Driveway Debris into the Street





- The percent of respondents who understand the great impact of hosing household driveway debris into the street more than doubled from 10% in 2003 to 21.6% in 2007.

Note. Chi² test indicates a significant difference between 2003 and 2007

Fertilizers & Chemicals — What You Can Do

- Test your soil. Most soil doesn't need fertilizer, but may need other nutrients
- Reduce the use of fertilizers and avoid applying more than you need
- Do not fertilize before rain storms
- Landscape with native plants rather than non-native plants which require much more fertilizer and pesticides
- Never dump oil or chemicals into storm drains

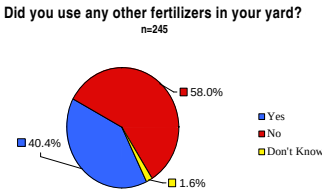
Fertilizers & Chemicals

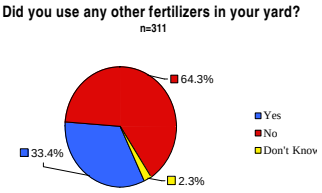
The Problem

- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life and make water unsafe for people
- The lake is murky and smells bad

Use of Other Fertilizers

- Though we see a positive trend in the number of respondents using fertilizer (58% vs. 64.3%, 2003 and 2007 respectively) we have questions around the phrasing and subset used for this question.





Summary of Key Findings

4 There was a statistically significant increase in knowledge about storm water.

4 There was a statistically significant increase in desired behavior reported for pet waste when walking a dog.

7 Any change in behavior for car washing is unclear.

4 There was a statistically significant increase in knowledge of the negative impact of household behaviors such as erosion from small home construction projects or hosing driveway debris into the street.

7 Any change in behavior for fertilizer/chemical use is unclear.

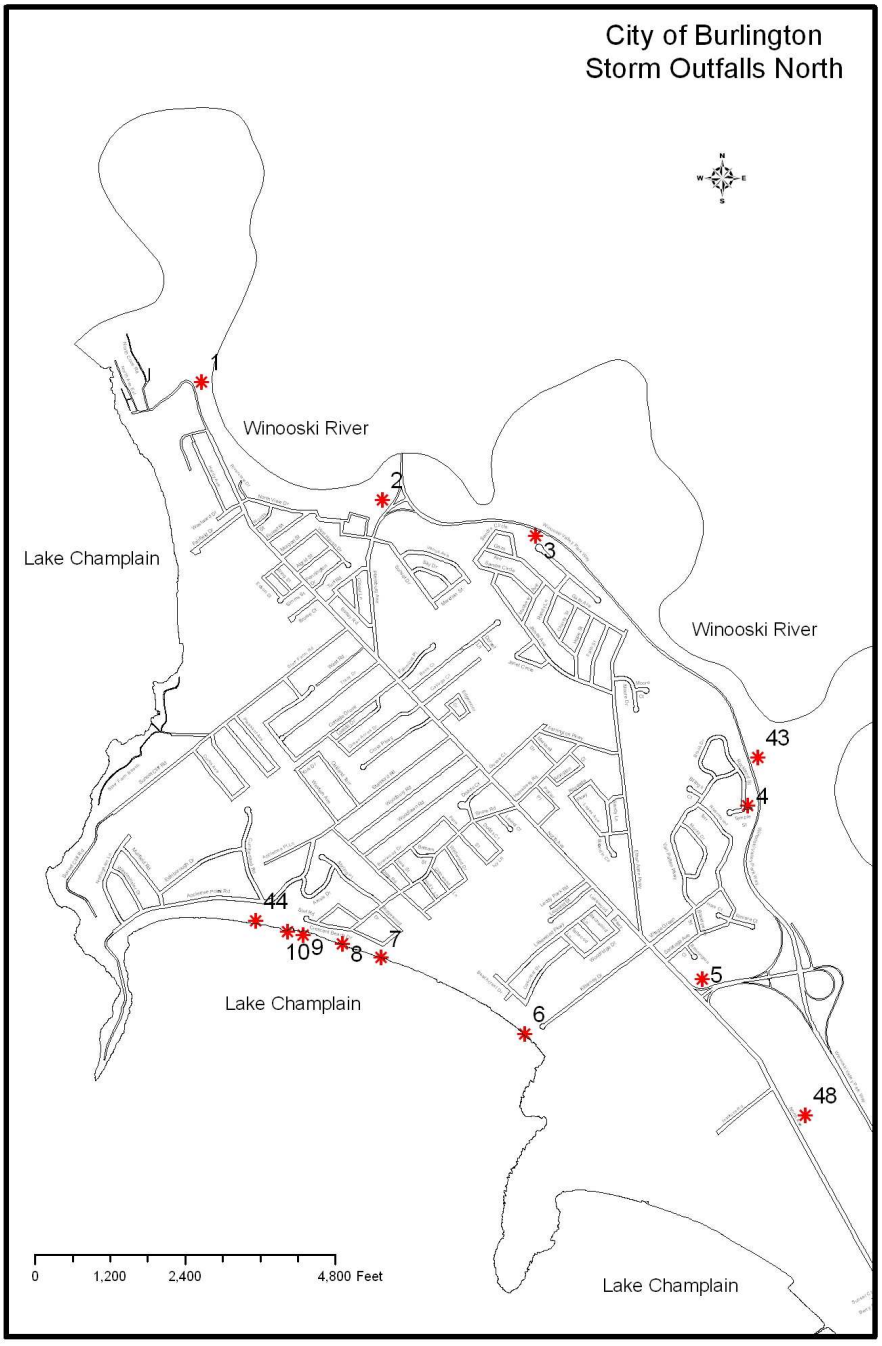
Regional Stormwater Education Program Participating Towns & Partners

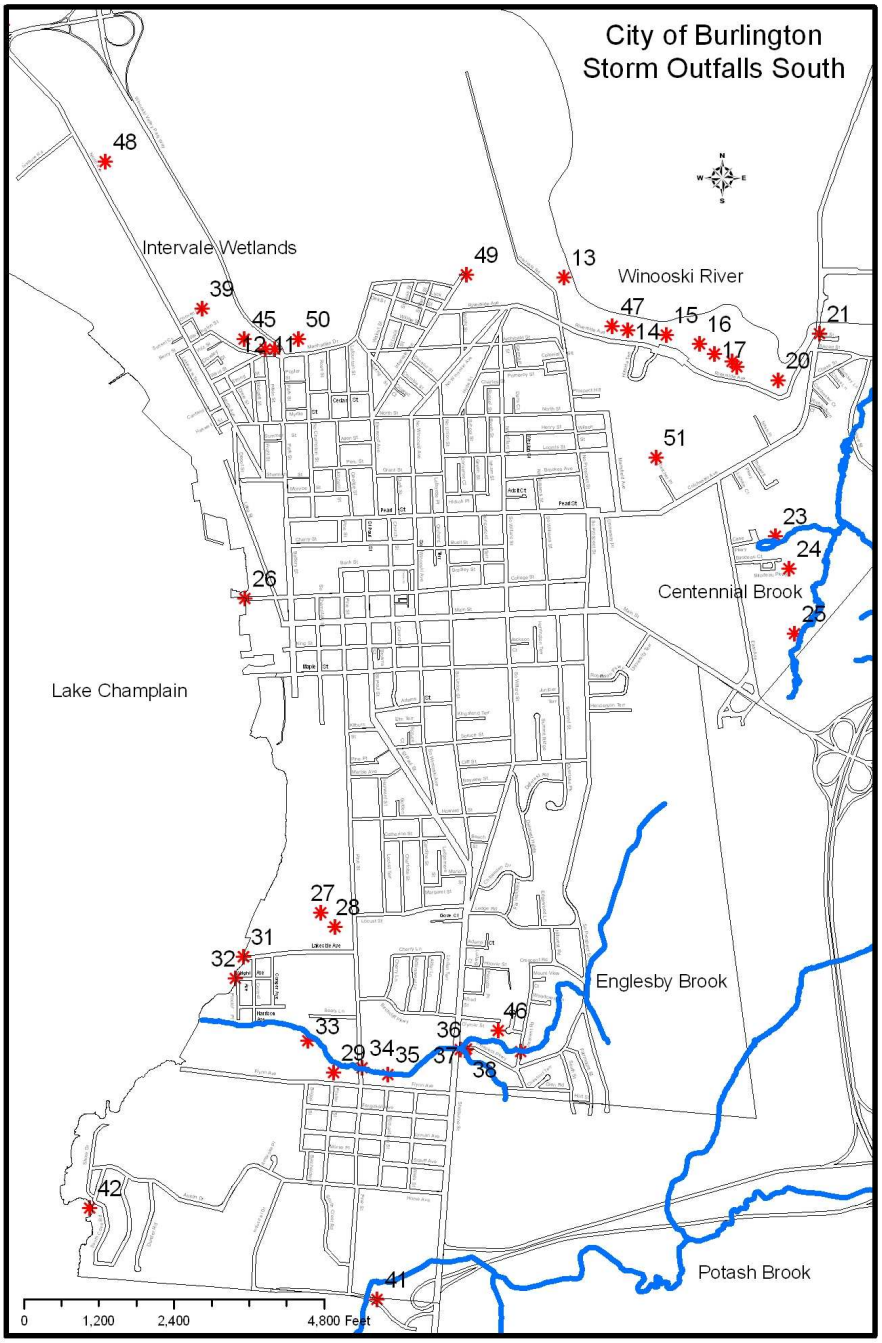
Town of Colchester
Town of Essex
Village of Essex Junction
Town of Shelburne
City of South Burlington
Town of Williston
Town of Winooski
Town of Milton
Burlington Department of Public Works
Burlington International Airport
University of Vermont
VT Agency of Transportation

APPENDIX B – GREEN UP 2007

Mayor Kiss Helping Out

APPENDIX C – OUTFALL LOCATIONS AND DISCHARGE MONITORING REPORTS




City of Burlington
Storm Outfalls South
Intervale Wetlands
Winooski River
Centennial Brook
Lake Champlain
Englesby Brook
Potash Brook
48
49
13
39
45
50
12
11
47
14
15
16
17
20
21
51
23
24
25
26
27
28
31
32
33
29
34
35
36
37
38
46
42
41
0
1,200
2,400
4,800 Feet

MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: Englesby Brook during rainfall event
Location: Samples taken from influent/effluent of O8 pond, above and below pond
Watershed/Drainage: Englesby to Lake Champlain
Monitoring Date(s): 3/26/07
Sample Collected By: S. Roy
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: 3/26/07
Analytical Methods: Standard Methods 9223 (*E. Coli*)

Date/Time	Parameter	Units	Results	Comments
3/26 1347	*E. Coli*	cfu/100mls	60	Brook at former Panda above pond
3/26 1345	*E. Coli*	cfu/100mls	550	O8 influent sample
3/26 1340	*E. Coli*	cfu/100mls	168	O8 effluent sample
3/26 1355	*E. Coli*	cfu/100mls	124	Brook at Pine Street below pond

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Approved by: Steven Goodkind (Authorized Agent for Permittee)

MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: Englesby Brook during rainfall event
Location: Samples taken from influent/effluent of O8 pond, above and below pond
Watershed/Drainage: Englesby to Lake Champlain
Monitoring Date(s): 4/30/07
Sample Collected By: S. Roy
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: 4/30/07
Analytical Methods: Standard Methods 9223 (*E. Coli*)

Date/Time	Parameter	Units	Results	Comments
4/30 1030	*E. Coli*	cfu/100mls	275	Brook at former Panda above pond
4/30 1025	*E. Coli*	cfu/100mls	2143	O8 influent sample
4/30 1045	*E. Coli*	cfu/100mls	86	O8 effluent sample
4/30 1040	*E. Coli*	cfu/100mls	288	Brook at Pine Street below pond

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MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: Englesby Brook during rainfall event
Location: Samples taken from influent/effluent of O8 pond, above and below pond
Watershed/Drainage: Englesby to Lake Champlain
Monitoring Date(s): 5/16/07
Sample Collected By: S. Roy
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: 5/16/07
Analytical Methods: Standard Methods 9223 (*E. Coli*)

Date/Time	Parameter	Units	Results	Comments
5/16 1030	*E. Coli*	cfu/100mls	3993	Brook at former Panda above pond
5/16 1020	*E. Coli*	cfu/100mls	3076	O8 influent sample
5/16 1037	*E. Coli*	cfu/100mls	1354	O8 effluent sample
5/16 1045	*E. Coli*	cfu/100mls	3654	Brook at Pine Street below pond

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

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MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: Oakledge Tributary to Lake Champlain
Location: Tributary located at south end of Blanchard Beach at Oakledge Park
Watershed/Drainage: Lake Champlain
Monitoring Date(s): 8/30/07
Sample Collected By: S. Roy
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: 8/30/07
Analytical Methods: Standard Methods 9223 (*E. Coli*)

Date/Time	Parameter	Units	Results	Comments
8/30 1453	*E. Coli*	cfu/100mls	63	Mouth of tributary

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Approved by: Steven Goodkind (Authorized Agent for Permittee)

MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: Central Avenue Catch Basin
Location: End of Central Avenue near Englesby Brook
Watershed/Drainage: Englesby to Lake Champlain
Monitoring Date(s): 9/26/07
Sample Collected By: S. Roy
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: 9/26/07
Analytical Methods: Standard Methods 4500-H^+ B (pH) and 9223 (*E. Coli*)

Date/Time	Parameter	Units	Results	Comments
9/26 1055	*pH*	pH units	6.82	Close to neutral pH
9/26 1050	*E. Coli*	cfu/100mls	1034	Calculated E. Coli spike at 1623 (36% mortality)
9/26 1050	*E. Coli*	cfu/100mls	1274	Calculated E. Coli spike at 325 (-392% mortality)

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Approved by: Steven Goodkind (Authorized Agent for Permittee)

MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: See Comments section
Location: See Comments section
Watershed/Drainage: See Comments section
Monitoring Date(s): See Date/Time section
Sample Collected By: S. Roy, E. Demers
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: See Date/Time section
Analytical Methods: Standard Methods 9223 (*E. Coli*), Optical Brightener (OB)

Date/Time	Parameter	Units	Results	Comments
10/15 0910	*E. Coli*	cfu/100mls	10	Crescent Beach outfall to L. Champlain
10/23	*OB*	none	negative	Crescent outfall. OB pad deployed from 10/15 – 10/23/07
10/15 0920	*E. Coli*	cfu/100mls	0	55 Crescent Beach outfall
10/23	*OB*	none	negative	55 Crescent Beach. OB pad deployed from 10/15 – 10/23/07
12/5 0935	*E. Coli*	cfu/100mls	10	Lori Lane outfall to groundwater
12/10	OB	none	negative	Lori Lane outfall. OB pad deployed from 12/5 – 12/10/07
12/5 1030	*E. Coli*	cfu/100mls	1100	Appletree outfall to L. Champlain
12/10	OB	none	negative	Appletree outfall. OB pad deployed from 12/5 – 12/10/07
12/5 1000	*E. Coli*	cfu/100mls	10	North Ave outfall to Intervale
12/10	OB	none	negative	North Ave outfall. OB pad deployed from 12/5 – 12/10/07
12/5 1025	*E. Coli*	cfu/100mls	0	Alexis Drive outfall to L. Champlain
12/10	OB	none	negative	Alexis Drive outfall. OB pad deployed from 12/5 – 12/10/07
12/5 0950	*E. Coli*	cfu/100mls	7270	Plattsburgh outfall to Winooski River
12/10	OB	none	negative	Plattsburgh outfall. OB pad deployed from 12/5 – 12/10/07

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

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MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: See Comments section
Location: See Comments section
Watershed/Drainage: See Comments section
Monitoring Date(s): See Date/Time section
Sample Collected By: S. Roy, E. Demers
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: See Date/Time section
Analytical Methods: Standard Methods 9223 (*E. Coli*), Optical Brightener (OB)

Date/Time	Parameter	Units	Results	Comments
12/10 0800	*E. Coli*	cfu/100mls	>24,192	Plattsburgh outfall to Winooski River
12/10 0920	*E. Coli*	cfu/100mls	1669	Appletree north outlet to pond
12/10 0915	*E. Coli*	cfu/100mls	2613	Appletree middle outlet to pond
12/10 0920	*E. Coli*	cfu/100mls	959	Appletree south outlet to pond
12/10 0910	*E. Coli*	cfu/100mls	3448	Appletree outfall to L. Champlain
12/14	OB	none	negative	Appletree outfall. OB pad deployed from 12/10 – 12/14/07
12/11 1310	*E. Coli*	cfu/100mls	0	Queen City Park outfall to Potash Brook
12/14	OB	none	negative	Queen City Park outfall. OB pad deployed from 12/11 – 12/14/07
12/11 1320	*E. Coli*	cfu/100mls	0	Oakledge triburary to L. Champlain
12/14	OB	none	negative	Oakledge tributary. OB pad deployed from 12/11 – 12/14/07
12/11 1415	*E. Coli*	cfu/100mls	10	Pine Street outfall to Barge Canal. OB pad lost.
12/11 1355	*E. Coli*	cfu/100mls	17329	Shelburne Road outlet to O8 pond
12/14	OB	none	negative	Shelburne/O8 inlet. OB pad deployed from 12/11 – 12/14/07
12/11 0835	*E. Coli*	cfu/100mls	0	Riverside (map #15) pipe to Winooski R
12/14	OB	none	negative	Riverside (map #15) outlet. OB pad deployed from 12/11 – 12/14/07
12/11 0905	*E. Coli*	cfu/100mls	0	Riverside (map #19) pipe to Winooski R
12/14	OB	none	negative	Riverside (map #19) outlet. OB pad deployed from 12/11 – 12/14/07

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Approved by: Steven Goodkind (Authorized Agent for Permittee)

MONITORING REPORT FOR DISCHARGES FROM MUNICIPAL STORM SEWER SYSTEMS AUTHORIZED BY GENERAL PERMIT #3-9014

MS4: Burlington Comments/Additional Information: Illicit Discharge
Discharge Point Name: See Comments section
Location: See Comments section
Watershed/Drainage: See Comments section
Monitoring Date(s): See Date/Time section
Sample Collected By: S. Roy, E. Demers
Analyst or Laboratory: Main WWTP Lab
Date(s) of Analysis: See Date/Time section
Analytical Methods: Standard Methods 9223 (*E. Coli*), Optical Brightener (OB)

Date/Time	Parameter	Units	Results	Comments
12/11 0915	*E. Coli*	cfu/100mls	288	Colchester Ave (map #21) to Winooski R
12/14	OB	none	negative	Colchester Ave (map #21). OB pad deployed from 12/11 – 12/14/07
12/11 0825	*E. Coli*	cfu/100mls	0	Riverside (map #18) to Winooski R
12/14	OB	none	negative	Riverside (map #18) outlet. OB pad deployed from 12/11 – 12/14/07
3/10 0747	*E. Coli*	cfu/100mls	11199	Plattsburgh outfall to Winooski River
3/10	OB	none	positive	Plattsburgh outfall. OB pad deployed from 3/7 – 3/10/08
3/17	*E. Coli*	cfu/100mls	200	110 Plattsburgh Avenue
3/17	OB	none	negative	110 Plattsburgh. OB pad deployed from 3/11 – 3/17/08
3/17	*E. Coli*	cfu/100mls	>24192	Plattsburgh Avenue at Sunset
3/17	OB	none	positive	Plattsburgh at Sunset. OB pad deployed from 3/11 – 3/17/08
3/17	*E. Coli*	cfu/100mls	565	Plattsburgh outfall to Winooski River
3/17	OB	none	positive	Plattsburgh outfall. OB pad deployed from 3/11 – 3/17/08

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

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APPENDIX D – DRAFT STORMWATER AND EROSION CONTROL STANDARDS

Sec. 5.5.3 Stormwater and Erosion Control

The purpose of this Section is to establish minimum stormwater management requirements and erosion controls to protect and safeguard the general health, safety, and welfare of the public residing within this community. This ordinance seeks to meet that purpose through the following objectives:

- minimize stormwater runoff from development in order to reduce flooding, siltation, streambank erosion, and to maintain the integrity of natural stream channels;
- prevent erosion and the transport of sediment and pollutants off lot, onto the City of Burlington streets and sidewalks, into the City of Burlington stormwater system, and/or waters of the State;
- minimize the effects of non-point source pollution on local surface and subsurface water quality;
- minimize the total volume of surface water runoff that flows from any specific site during and following development in order to replicate the pre-development hydrology to the maximum extent practicable;
- reduce stormwater runoff rates and volumes, soil erosion and non-point source pollution, wherever possible, through stormwater management controls and to ensure that these management controls are properly maintained and pose no threat to public safety;
- wherever possible provide stormwater management and erosion control strategies that lead to an overall improvement in the quality of the waters of the state; and,
- meet the requirements of the Vermont's 2002 Stormwater Management Rules and Guidance Vol. I and II (or latest State standard).

Applicability

This Section shall apply to all new development and redevelopment projects for which Major Impact Review is required pursuant to the requirements of Article 3, and/or those where a 400 square foot or more increase in impervious surface or amount of disturbed area is proposed and/or, regardless of the amount of impervious surface or disturbed area proposed, where any change in existing hydrological conditions is proposed. All projects must meet "as best possible" the requirements of Vermont's current stormwater standards. The City Engineer at the Department of Public Works shall determine whether the stormwater requirements have been met as best possible. Applicable stormwater management and erosion control standards shall be determined by whether a project is subject to Major Impact review or not.

All projects subject to Part (D) shall receive Department of Public Works review prior to receiving any Major Impact review approval or zoning permit.

Exemptions

The following activities are exempt from these stormwater performance criteria:

(1) Any silvicultural and agricultural activity undertaken consistent with applicable Acceptable Management Practices (AMP) published by the state of Vermont.

Design Manual

The Dept. of Public Works may furnish additional policy, criteria, and information, for the proper implementation of the requirements of this Section and may provide such information in a Design Manual which may include a list of acceptable stormwater treatment practices, including the specific design criteria for each stormwater practice. The manual may be updated and expanded from time to time, at the discretion of the Dept. of Public Works, based on improvements in engineering, science, monitoring, and local maintenance experience. Stormwater treatment practices that are designed and constructed in accordance with these design and sizing criteria will be presumed to meet the minimum water quality performance standards.

Erosion Control and Stormwater Management Standards – Major Impact Projects

1.) Application Submittal Requirements - Erosion Prevention Sediment Control (ESPC) Plan:

Unless otherwise exempted by this Article, every zoning permit application involving Major Impact Review shall be accompanied by an "Erosion Prevention Sediment Control (ESPC) Plan" in order for the permit application to be considered. The ESPC Plan shall:

a) Identify the contractor who is responsible for installing, implementing, and maintaining the EPSC plan and measures;

b) Identify the onsite contractor who is responsible for the day-to-day monitoring, oversight, and inspections required by the EPSC plan;

c) Assure that any amendments to the project EPSC plan are filed with the Department of Public Works and the Development Review Board;

d) Provide that the erosion control measures remain n place until vegetation has become established on all disturbed surfaces and clearly identify under what conditions final site stabilization has occurred; and,

e) Provide a process whereby the Department of Public Works and Code Enforcement participate in the final site stabilization program.

The Erosion Prevention Sediment Control Plan shall seek to:

a) Prevent erosion and the transport of sediment off lot, onto the public streets and sidewalks, into the municipal stormwater system, and/or waters of the State;

b) Prevent parking of any construction or construction related vehicles on City owned green space. Damage to green space shall be immediately addressed;

c) Take any and all steps necessary to abate erosion and to clean up all resulting sediment deposited, discharged or found to exist off lot, on City streets and sidewalks, and/or in the City stormwater system;

d) Maintain project erosion prevention and sediment control devices/measures and perform requisite cleanup of resulting sedimentation. This may include, but is not limited to, daily sweeping of streets and sidewalks and cleaning City stormwater catch basins;

e) Specify appropriate seed and fertilizer applications that are ecologically sound and site specific;

f) Specify an appropriate mulch when and where needed and adequate anchoring measures to prevent blow away;

g) Specify an effective grass re-vegetation program. Turf replacement is recommended in areas where re-vegetation of grass proves difficult with seeding and mulch. To reestablish all existing and proposed green space and where practical consider porous (pervious) pavers;

h) Engage the contractor to be proactive in planning and executing construction phase activities with the goal of preventing erosion and controlling sediment;

i) Identify the parties to the EPSC plan and clearly define their respective roles and responsibilities including, but not limited to, the contractor, the onsite coordinator, those responsible for project adherence to the EPSC, and those participating in inspections and acceptance of final site stabilization; and,

j) Define the overall strategy for the EPSC plan by:

    i) Limiting actual disturbance area and time of disturbance;

    ii) Employing proper site stabilization (addressing soil preparation for final seeding and landscaping, seed, pesticide/herbicide use, and mulch);

    iii) Specifying stone and/or grass swale lining where appropriate;

    iv) Specifying where necessary to employ erosion control blankets or mats;

    v) Specifying locations for silt fence and construction barrier fence; and,

vi) Specifying catch basin inlet protection during construction clean up and maintenance and after construction system operation and maintenance.

Prior to issuance of a certificate of occupancy, the project engineer must certify in writing that, among other things, the project EPSC plan as approved by the Department of Public Works has been complied with and final site stabilization has occurred. This certification shall be filed with the Department of Planning & Zoning.

Information requirements for the Erosion Prevention Sediment Control Plan may be adjusted or waived by the City Engineer for a particular development application upon written request of the applicant, provided that at least one of the following circumstances can be demonstrated:

a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and theses measures comply with local ordinance(s).

b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

2.) Application Submittal Requirements - Stormwater Management Plan:

Unless otherwise exempted by this Article, every zoning permit application requiring Major Impact Review must be accompanied by a "Stormwater Management Plan" in order for the application to be considered. The City shall prescribe the form(s) and information that shall be submitted to determine compliance with this Section, with sufficient copies for necessary referrals and records. The requirements for stormwater management facilities may be waived in whole or in part by the development review board, provided that it is demonstrated by the applicant that at least one of the following conditions applies:

a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and these measures comply with local ordinance(s).

b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

3.) General Performance Criteria for Stormwater Management:

The latest edition of the Vermont Stormwater Management Manual shall be used as the standard for general performance criteria for stormwater management.

4.) Integrated Management Practices:

Applicants shall utilize Integrated Management Practices/Best Management Practices to meet the standards established in 3 above using one or more approved design options. Low Impact Design options are encouraged. Descriptions and standard details of approved Integrated Management Consideration shall be given in all stormwater management strategies to the relationship between temporary facilities required and installed during

construction as part of soil erosion and sedimentation control regulations; and permanent facilities designed to manage stormwater post construction on an on-going basis.

5.) Maintenance:

Stormwater Management Facilities that are constructed on privately-owned land and that are not within a public easement shall be maintained by the owner of the subject property. Stormwater Management Facilities that are constructed on public land, within public rights-of-way, and/or within public easements shall be maintained by the public body with ownership/jurisdiction. The following requirements shall be met for all stormwater management facilities that are constructed on privately-owned property and not within a public easement.

a) Maintenance Easement

Prior to the issuance of any permit that has a stormwater management facility as one of the requirements of the permit, the applicant or owner of the site must execute a maintenance easement agreement that shall be binding on all subsequent owners of land served by the stormwater management facility. The agreement shall provide for access to the facility at reasonable times for periodic inspection by the City, or its contractor or agent, and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any other provisions established by this Section. The property owner shall record such easement, in a form and format approved by the City Attorney, in the City Land Records with the City Clerk's Office.

b) Maintenance Covenants

Maintenance of all stormwater management facilities shall be ensured through the creation of a formal maintenance covenant in a form and format approved by the City Attorney, in the City Land Records with the City Clerk's Office. This covenant shall be entitled, "Stormwater Operations and Maintenance Plan." A schedule for maintenance and inspections shall be included as part of the covenant. The owner, or the owner's assigns, are responsible for maintenance of stormwater management facilities; however, the City may, under certain circumstances, accept dedication of existing or future stormwater management facilities for public maintenance and inspection.

c) Requirements for Maintenance Covenants

All stormwater management facilities must be inspected by the responsible party, in accordance with the approved schedule in the Stormwater Operations and Maintenance Plan, to identify maintenance and repair needs, and to ensure compliance with the requirements of this ordinance. Any identified maintenance and/or repair needs found must be promptly addressed by the responsible party. The inspection and

maintenance requirement may be increased as deemed necessary by the City to ensure proper functioning of the stormwater management facility.

d) Records of Installation and Maintenance Activities

Parties responsible for the inspection, operation, and maintenance of a stormwater management facility shall make records of the installation and of all maintenance and repairs and shall retain the records for at least 5 years. These records shall be made available to the City Engineer upon request and/or as specifically outlined in the maintenance covenant.

e) Failure to Maintain Practices

If a responsible party fails or refuses to meet the requirements of the maintenance covenant, the City, after reasonable notice, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition. In the event that the stormwater management facility becomes a danger to public safety or public health, or is otherwise not functioning as designed, the City shall notify the party responsible for maintenance of the stormwater management facility in writing. Upon receipt of that notice, the responsible person shall have thirty (30) days to effect maintenance and repair of the facility in an approved manner. After proper notice, the City may assess the owner(s) of the facility for the cost of repair work and any penalties; and the cost of the work shall be a lien on the property, or prorated against the beneficial users of the property, and may be placed on the tax bill and collected as ordinary taxes by the City.

6.) <u>Inspection:</u>

a) Inspection of Stormwater Facilities

Inspections shall be conducted as prescribed by the Stormwater Operations Maintenance Plan covenant. Additional inspections may be conducted by the City on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type that are more likely than the typical discharge to cause violations of State or Federal water or sediment quality standards or the National Pollutant Discharge Elimination System (NPDES) stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other stormwater treatment practices.

b) Right-of-Entry for Inspection

When any new drainage control facility is installed on private property, or when any new connection is made between private property and a public drainage control system the property owner shall grant to the City the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. This includes the right to enter a property when the City has a reasonable basis to believe that a violation of this ordinance is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this ordinance.

Erosion Control and Stormwater Management Standards – Projects Not Subject to Major Impact Review

1.) Application Submittal Requirements for Erosion Control & Stormwater Management:

Unless otherwise exempted by this Article, every zoning permit application not subject to Major Impact review and involving a 400 square foot or more increase in impervious surface or amount of disturbed area must be accompanied by an erosion control and stormwater runoff plan. Information requirements may be adjusted or waived by the City Engineer for a particular development application upon written request of the applicant, provided that at least one of the following circumstances can be demonstrated:

a) Alternative measures for on-site and/or off-site management of stormwater have been proposed, and theses measures comply with local ordinance(s).

b) It is otherwise demonstrated that the proposed development will not produce any significant change to the existing pre-application hydrology.

The erosion control and stormwater runoff plan shall include, at a minimum, the following items depicted on a site plan:

a) Indication of disturbance limits and the protection of existing vegetation that is to be preserved;

b) Clearing and grading limits that do not exceed maximum lot coverage at any one time;

c) Diverting the flow of runoff and melt water away from cleared and graded areas;

d) Temporary and permanent stabilization of the site; and

e) The protection of any channels that may become enlarged or destabilized from erosion.

2.) General Performance Criteria for Erosion Control & Stormwater Management:

The following are required stormwater management performance criteria:

a) All earthen material associated with, or disturbed by, the project shall be retained on the subject property.

b) Bare earthen material shall immediately be stabilized with erosion control netting and/or with seed and mulch to establish vegetative cover.

c) The rate and volume of stormwater runoff post-construction shall not exceed the pre-construction rate or volume.

d) Land disturbance within the stream channel of any ephemeral stream shall be minimized.

e) Applicants shall utilize Integrated Management Practices/Best Management Practices on an ongoing basis.

3.) Maintenance:

Stormwater management facilities that are constructed on privately-owned land and that are not within a public easement shall be maintained by the owner of the subject property. Stormwater Management Facilities that are constructed on public land, within public rights-of-way, and/or within public easements shall be maintained by the public body with ownership/jurisdiction. In all cases, stormwater facilities shall be kept in working order and shall be inspected and maintained at least annually.

APPENDIX E – NATURAL RESOURCE PROTECTION OVERLAY DISTRICT

Sec. 4.5.4 Natural Resource Protection Overlay (NR) District

(A) Purpose and Authority

The Natural Resource Protection Overlay District is intended to:

Protect surface waters and wetlands from encroachment by development, and from sources of non-point pollution;

Protect the functions and values of Burlington's wetlands;

Protect and enhance water quality near public beaches and other water-based recreation areas from sources of non-point pollution;

Preserve natural features and communities, geologic features and cultural sites for education and research.

Provide opportunities for public access where feasible and appropriate;

Facilitate connections and corridors for wildlife between areas of publicly protected sites.

Ensure that development that occurs within a Flood Hazard Area conforms to the requirements of the National Flood Insurance Program.

These regulations are enacted under provisions of 24V.S.A. Sections 4405, 4407, 4412, and 4417.

(B) Areas Affected

This overlay district includes all areas delineated on Map 4.5.4 A-Natural Resources Protection Overlay (NR) District and is divided into four (4) subparts:

1. A **Riparian and Littoral Conservation Zone** which consists of all surface water and a corresponding buffer area which is equally divided into an inner and an outer buffer except as otherwise noted, and specifically includes the following areas:

a. Within 250 feet of the Lake Champlain shoreline with the exception of that portion of the shoreline between the northern property line of the former Moran Generating Station and the most westerly extent of Roundhouse Point described as the "Urban Waterfront" in the *2000 Open Space Protection Plan*;

b. Within 250 feet of the Winooski River shoreline;

c. Within 100 feet of the Engelsby, Potash or Centennial Brook shoreline; and,

d. Within 50 feet of the shoreline of all other areas inundated by water including rivers and streams, lakes and ponds;

2. A **Wetland Conservation Zone** which consists of all wetlands and a corresponding buffer area which is equally divided into an inner and an outer buffer except as otherwise noted, and specifically includes the following areas:

a. Within 100 feet of all VT Class 1 and 2 wetlands except in cases where the State of Vermont has established a greater buffer zone width; and.

b. Within 100 feet from all vernal pools.

3. A **Natural Areas Zone** which consists of all areas identified as Significant Natural Areas in the City's *Open Space Protection Plan* and a corresponding buffer area of 100 feet which is equally divided into an inner and an outer buffer except as otherwise noted.

4. A **Flood Hazard Zone** as defined and delineated by the Federal Emergency Management Agency for the purposes of administering the National Flood Insurance Program.

(C) District Specific Regulations: Riparian and Littoral Conservation Zone

1. Permitted Uses: Inner and Outer Buffer

Except where otherwise noted herein, only the following uses are permitted within the inner and outer buffer subject to the requirements and limitations set forth below under subpart 4.

Normal maintenance of existing lawns and maintained grounds including mowing, trimming of vegetation and the removal of dead or diseased vegetation around a residence, decorative landscaping and planting, vegetable and flower gardens, and the repair of existing private landscaping structures such as walkways and walls.

Application of pesticides performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9). In no other cases shall pesticides be applied.

"Accepted agricultural practices" as defined under 24 VSA Ch 117;

Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

Stormwater outfall as part of a stormwater management plan approved by the city engineer. In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

Normal maintenance of existing docks, roads, rail lines, bridges, and culverts provided that disturbance to any shoreland is minimized in conjunction with such maintenance;

Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle; and,

Recreational and educational activities such as hiking, walking, fishing, nature study, and bird watching and associated boardwalks and unimproved trails.

2. Prohibited Uses: Inner Buffer

Except where noted herein, the following uses shall be prohibited within the inner buffer.

Any land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) not associated with a permitted or conditionally permitted use.

The deposition or introduction of organic and inorganic chemicals, including herbicides and pesticides,

The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized vehicles used to construct and maintain permitted or regulated activities are specifically exempted from this prohibition);

The construction of buildings or other structures, and roads, parking areas or any other impervious surface.

3. Conditional Uses: Outer Buffer

Except where otherwise noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district may be approved only within the outer buffer after review and approval pursuant to the Conditional Use review provisions of Article 3 and subject to the requirements and limitations below under subpart 4.

4. Requirements

(a) Land disturbing activities which expose more than 5,000 or more square feet of soil (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) where a stormwater management, erosion prevention and sediment control plan has been reviewed by the Burlington Conservation Board and approved by the city engineer.

(b) Agricultural activities shall follow the Secretary of Agriculture's Best Management Practices for the Protection of Water Quality.
(c) Installation of any seawalls, rip-rap or other shoreland retention structures shall be submitted for review by the Burlington Conservation Board who shall consult with the city engineer prior to issuance of a recommendation to the development review board.

(d) No new stormwater outfall shall directly discharge into surface water without approval and implementation of a stormwater management plan approved by the city engineer.

(e) Stormwater management, erosion prevention, and sedimentation control plans shall be submitted for review by the Burlington Conservation Board who shall consult with the development review board and city engineer prior to issuance of a recommendation to the city engineer who shall render a final decision on such plans.

(f) In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

(D) District Specific Regulations: Wetland Conservation Zone

1. Additional Application Requirements

The following information shall be submitted in addition to the applicable requirements of Article 3 for development involving site that include wetlands:
(a) Boundary Determination: The boundaries of a wetland shall be determined in the field by a qualified professional with expertise in wetland delineation and surveyed by a licensed land surveyor or other qualified individual. The boundary between wetland and upland shall be delineated by the methodology set forth in the 1987 edition of the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. The identification and delineation of wetlands for a proposed project must be performed within the five-year period prior to submission and acceptance of a complete zoning application.

(b) A report addressing the project's impact on the significant wetland functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize wetland impacts shall be prepared by a qualified professional with expertise in wetland delineation and evaluation.

(c) A site plan for a project that will impact a wetland or buffer zone shall include delineated wetland boundaries, buffer zone boundaries, erosion control measures, and all components of the proposed project, including, but not limited to all structures, driveways, parking areas, lawns, utilities, and the overall footprint of the construction area/zone of disturbance.

(d) As part of their zoning permit application, applicants must submit a complete stormwater management, erosion prevention and sediment control plan and successfully demonstrate how the project manager will prevent adverse impacts to surface water and groundwater quality before, during, or after construction. At a minimum, an applicant should demonstrate how a project will meet the standards outlined in the latest edition of the Vermont Soil Erosion Handbook.

2. Permitted, Regulated, and Prohibited Uses:

(a) Permitted Uses: Wetland or Wetland Buffer:

Except where otherwise noted herein, only the following uses are permitted within a wetland and its buffer zone subject to the requirements and limitations set forth below under subpart e.

Normal maintenance of existing lawns and maintained grounds including mowing, trimming of vegetation and the removal of dead or diseased vegetation around a residence, decorative landscaping and planting, vegetable and flower gardens, and the repair of existing private landscaping structures such as walkways and walls.

Application of pesticides performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9). In no other cases shall pesticides be applied.

"Accepted agricultural practices" as defined under 24 VSA Ch 117.

Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

Stormwater outfall as part of a stormwater management plan approved by the city engineer. In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

Normal maintenance of existing roads, rail lines, bridges, and culverts provided that disturbance to naturally occurring wetlands and shorelands is minimized in conjunction with such maintenance;

Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle;

Recreational and educational activities such as fishing, walking, hiking, nature study, and bird watching.

(b) Prohibited Uses: Wetland and Inner Buffer

Except where noted herein, the following uses shall be prohibited within the inner buffer. Land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) not associated with a permitted or conditionally permitted use.

The deposition or introduction of organic and inorganic chemicals, including pesticides,

The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized construction vehicles used to construct permitted or regulated activities in the wetland are specifically exempted from this prohibition) ;

The construction of buildings or other structures, and roads, parking areas or other impervious surface.

(c) Conditional Uses: Outer Buffer
Except where noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district, including the list of activities below, may be approved within the outer buffer after review and approval pursuant to the Conditional Use Review provisions of Article 3 and subject to the requirements and limitations set forth below under subpart 3 below.

Any land disturbing activities which expose 5,000 or more square feet of soil (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) where a stormwater management, erosion prevention and sediment control plan has been reviewed by the Burlington Conservation Board and approved by the city engineer.

Any form of drainage, dredging, excavation, or removal of material either directly or indirectly;

Alteration or modification of natural drainage patterns, natural features and contours;

Installation of docks, rip-rap or other shoreline stabilization features

Installation of utility poles or utility service lines, underground pipes or cable conduits, and wells;

Cutting of greater than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle

Construction, expansion or placement of any structure;

Construction or expansion of existing roads, rail lines parking areas, trails, and sidewalks;

Introduction of any form of pollution, including but not limited to the installation of a septic tank, the running of a sewer outfall, or the discharge of sewage treatment effluent or other liquid wastes into or so as to drain into a wetland;

(d) Prohibited activities in a vernal pool and buffer zone:
Except where noted herein, the following uses shall be prohibited within a vernal pool and its respective buffer.

Any activities which disturb the area within 100 feet of a vernal pool, including, but not limited to timber harvesting, disturbance of the understory vegetation, pesticide or herbicide application, the erection of fences or other barriers to amphibian dispersal, barriers and any other type of human activities that disturb the vegetation or water quality in the pool and buffer.

3. Criteria for Review

In granting, denying, or conditioning any permit, the DRB, in consultation with the Conservation Board, will consider the significant functions and values of the wetland, the project's impact on the significant functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize wetland impacts. The DRB shall only approve a project having an impact on a wetland or wetland buffer zone if an applicant can demonstrate that any adverse impact is de minimus on the significant functions and values of the wetland including:

Water storage for floodwater and stormwater;

Erosion and sedimentation control through binding and stabilizing the soil or shoreline;

Surface water and groundwater protection, including sediment and toxicant retention, nutrient retention and transformation, and groundwater discharge and recharge;

Fisheries habitat;

Wildlife habitat;

Examples of natural community types that are exemplary, rare, or make an important contribution to the natural heritage of Burlington and Vermont;

Habitat for rare, threatened and endangered species;

Education and research in natural sciences;

Recreational and economic benefits; and,

Open space and aesthetics.

In addition, the review of a project having involving a wetland or wetland buffer zone shall also be subject to the following requirements and limitations:

No new stormwater outfall shall directly discharge into surface water without approval and implementation of a stormwater management plan approved by the city engineer.

No installation of docks, rip-rap or other shoreline stabilization features shall be installed without review approval by the city engineer.

Agricultural activities shall follow the Secretary of Agriculture's Best Management Practices for the Protection of Water Quality.

Stormwater management, erosion, and sedimentation control plans shall be submitted for review by the Burlington Conservation Board who shall consult with the development review board and city engineer prior to issuance of a recommendation to the city engineer who shall render a final decision on such plans.

In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

(E) District Specific Regulations: Natural Areas Zone

1. Additional Application Requirements

The following information shall be submitted in addition to the applicable requirements of Article 3 for development involving site that include wetlands:

(a) The boundaries of a Natural Area shall be determined in the field by a qualified professional field naturalist with expertise in feature delineation and surveyed by a licensed land surveyor or other qualified individual. The identification and delineation must be performed within the five-year period prior to submission and acceptance of a complete zoning application.

(b) A report shall be prepared addressing the proposed project's impact on the natural areas functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize impacts.

(c) A site plan that shall include delineated Natural Area boundaries and the associated buffer zone with respect to the overall footprint of the construction area/zone of disturbance.

2. Permitted, Regulated, and Prohibited Uses:

(a) Permitted Uses: Natural Area and Buffer:

Except where otherwise noted herein, only the following uses are permitted within a natural area and its buffer zone subject to the requirements and limitations set forth below under subpart 3.

Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

Normal maintenance of existing roads, bridges, and culverts provided that disturbance to naturally occurring wetlands and shorelands is minimized in conjunction with such maintenance;

Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle;

Recreational and educational activities such as fishing, walking, hiking, nature study, and bird watching.

(b) Prohibited Uses: Natural Area and Buffer
Except where noted herein, the following uses shall be prohibited within the inner buffer.

Land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) not associated with a permitted or conditionally permitted use.

The deposition or introduction of organic and inorganic chemicals, including pesticides,

The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized construction vehicles used to construct permitted or regulated activities in the wetland are specifically exempted from this prohibition) ;

The construction of buildings or other structures, and roads, parking areas and any other impervious surfaces.

(c) Conditional Uses: Outer Buffer
Except where noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district, including the list of activities below, may be approved within the outer buffer after review and approval pursuant to the Conditional Use provisions of Article 3 and subject to the requirements and limitations set forth below under subpart 3.

Land disturbing activities which expose 5,000 or more square feet of soil (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) are prohibited except where a stormwater management, erosion prevention and sediment control plan has been reviewed by the Burlington Conservation Board and approved by the city engineer.

Any form of drainage, dredging, excavation, or removal of material either directly or indirectly;

Alteration or modification of natural drainage patterns, natural features and contours;

Installation of docks, rip-rap or other shoreline stabilization features
Installation of utility poles or utility service lines, underground pipes or cable conduits, and wells;

Cutting of greater than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle

Construction, expansion or placement of any structure;

Construction or expansion of existing roads, parking areas, trails, and sidewalks;

Introduction of any form of pollution, including but not limited to the installation of a septic tank, the running of a sewer outfall, or the discharge of sewage treatment effluent or other liquid wastes into or so as to drain into a wetland;

Agricultural activities following the Secretary of Agriculture's Best Management Practices for the Protection of Water Quality including but not limited to housing of livestock, manure storage, pasturing livestock, growing crops, and compost storage, but excluding residential backyard compost storage

3. Criteria for Review

In granting, denying, or conditioning any permit, the DRB, in consultation with the Conservation Board, will consider the significant functions and values of the natural area, the project's impact on the significant functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize impacts. The DRB shall only approve a project having an impact on a wetland or wetland buffer zone if an applicant can demonstrate that any adverse impact is de minimus on the significant functions and values of the natural area including:

Water storage for floodwater and stormwater;

Erosion and sedimentation control through binding and stabilizing the soil or shoreline;

Surface water and groundwater protection, including sediment and toxicant retention, nutrient retention and transformation, and groundwater discharge and recharge;

Fisheries habitat;

Wildlife habitat;

Examples of natural community types that are exemplary, rare, or make an important contribution to the natural heritage of Burlington and Vermont;

Habitat for rare, threatened and endangered species;

Education and research in natural sciences;

Recreational and economic benefits; and,

Open space and aesthetics.

(F) District Specific Regulations: Flood Hazard Area

1. Permitted Uses-FW and FH Districts

The following open land uses shall be permitted within the floodway (FW) and flood hazard (FH) district to the extent that they are not prohibited by any other ordinance and provided that they do not require the erection of structures or storage of materials and equipment, the borrowing of fill from outside the floodway area, or channel modification or relocation, and do not obstruct flood flows, nor result in any increase in flood levels during the occurrence of the base flood discharge, decrease the water-carrying capacity of the floodway or channel, or increase off-site flood damage potential:

(a) Agricultural uses, such as general farming, pasture, orchard, and grazing, outdoor plant nurseries, truck farming, and forestry;

(b) Recreation uses, such as parks, camps, picnic grounds, tennis courts, golf courses, golf driving ranges, archery and shooting ranges, hiking and riding trails, hunting and fishing areas, game farms, fish hatcheries, wildlife sanctuaries, nature preserves, swimming areas and boat launching sites; and/or

(c) Accessory residential uses, such as lawns, gardens, and parking areas. Among the uses not permitted are junkyards, mobile homes, and storage facilities for chemicals, explosives, flammable liquids or other toxic materials.

2. Permitted Accessory Uses.

Uses customarily accessory and incidental to any of the permitted uses listed in underlying zoning district may be permitted, subject to the limitations therein.

3. Conditional Uses - FH District.

All uses permitted in the underlying zoning district, except those permitted open space uses as listed in Section 4.5.4.G.1 above, are permitted only upon the granting of a conditional use by the development review board as per Article 3.
Upon receiving an application for a conditional use permit, the development review board shall, prior to holding a hearing and rendering a decision thereon, obtain from the applicant:
(a) Base flood elevation data for all subdivision proposals and other proposed new developments containing more than fifty (50) lots or covering more than five (5) acres;

(b) The elevation, in relation to mean sea level, of the lowest habitable floor, including basement, of all new construction or substantial improvements of structures;

(c) Confirmation if such structures contain a basement; and

(d) The elevation, in relation to mean sea level, to which any structure has been flood proofed. In addition, the development review board shall require of the applicant any of the following information deemed necessary for determining the suitability of the particular site for the proposed use:

(e) Plans in triplicate, drawn to scale, showing the location, dimensions, contours and elevation of the lot; the size and location on the site of existing and/or proposed structures, fill or storage of materials; the location and elevations of streets, water supply and sanitary facilities; and the relationship of the above to the location of the channel, floodway and base flood elevation where such information is available;

(f) A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel and cross-sectional areas to be occupied by the proposed development;

(g) A profile showing the slope of the bottom of the channel or flow line of the stream; and

(h) Specifications for building construction and materials, flood proofing, mining, dredging, filling, grading, paving, excavation or drilling, channel improvement, storage of materials, water supply and sanitary facilities.

4. Mandatory Notification

The development review board shall transmit one copy of the application and supporting information to the Department of Environmental Conservation in accordance with 24 V.S.A. section 4409 (c)(2)(A). In riverine situations, the development review board shall notify adjacent communities and the Agency of Natural Resources prior to approval of any alteration or relocation of a watercourse and submit copies of such notifications to the FIA Administrator.

5. Evaluation

In reviewing the application, the development review board shall consider the evaluation of the Department of Environmental Conservation and shall determine that the proposed use will conform to the development standards of subpart 7 below.

6. 30-Day Time Limit

No permit may be granted for new construction substantial improvement, filling, installation of a residential structure or the development of land in any area designated as a floodplain by the Department of Environmental Conservation prior to the expiration of a period of thirty (30) days following the submission of the application and a report describing the proposed use, the location requested and an evaluation of the effect of such proposed use on Burlington's municipal development plan and the regional plan, if any, to the Department of Environmental Conservation provided this subsection shall not be applicable to public utility generating stations and transmission lines which shall require the issuance of a certificate of public good under 30 V.S.A. 248 prior to any land filling or construction.

7. Special Review Criteria:

In reviewing each application, the development review board shall assure that the flood-carrying capacity within any portion of an altered or relocated watercourse is maintained and shall consider:

(a) The danger to life and property due to increased flood heights or velocities caused by encroachments;

(b) The danger that material may be swept on to other lands or down stream to the injury of others;

(c) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination and unsanitary conditions;

(d) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;

(e) The importance of the services provided by the proposed facility to the community;

(f) The availability of alternative locations not subject to flooding for the proposed use;

(g) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future;

(h) The relationship of the proposed use to the municipal development plan;

(i) The safety of access to the property in times of flood of ordinary and emergency vehicles;

(j) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood-waters expected at the site; and

(k) Such other factors as are relevant to the purposes of this ordinance.

8. Approval Conditions:

Upon consideration of those factors in subpart 7 above and the purposes of these regulations, the development review board shall attach the following conditions to any permit it chooses to grant. Such conditions require that:

(a) All residential structures have the first floor, including basement, elevated at least at or above, the base floods elevation;

(b) All development shall be designed to minimize flood damage to the proposed development and to public facilities and utilities;

(c) All new construction and substantial improvements for nonresidential purposes shall have the lowest floor, including basements, elevated at or above the base flood elevation or be designed to be watertight below the base flood elevation, with walls substantially impermeable and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A permit for a proposed building shall not be issued until a registered architect or engineer has reviewed the structural design, specifications and plans and has certified that the design and methods of construction are in accordance with meeting the provisions of this subsection;

(d) Structures shall be:
(i) Designed and anchored to resist flotation, collapse, or lateral movement during the occurrence of the base flood;
(ii) Constructed of materials resistant to flood damage;
(iii) Constructed by methods and practices that minimize flood damage; and
(iv) Constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;

(e) All development shall be designed to provide adequate surface drainage to reduce exposure to flood hazards;

(f) Any fill shall be prohibited that will cause any increase in the base flood level;

(g) The flood-carrying capacity within any altered or relocated portion of a watercourse shall be maintained;

(h) New and replacement water supply and sanitary sewer systems shall be designed so as to prevent the infiltration of floodwaters into the systems and discharge from the systems;

(i) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding;

(j) New and replacement manufactured homes shall be elevated on properly compacted fill such that the top of the fill (the pad) under the entire manufactured home will be above the base flood elevation;

(k) All necessary permits be obtained from those governmental agencies from which approval is required by federal or state law; and

(l) All new construction and substantial improvements that have fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage shall have permanent openings, designed to allow the entry and exit of flood waters in accordance with specifications of 60.3(c)(5) of National Flood Insurance Program (NFIP) Rules and Regulations.

(m) As prescribed by the district in which the FH is overlaid and as set forth in Articles 5 and 10.
(n) As prescribed by the district in which the FH is overlaid and as set forth in Articles 6 and 7.

9. Records.

The administrative officer shall maintain a record of:

(a) The elevation, in relation to mean sea level, of the lowest habitable floor, including basement, of all new or substantially improved structures, and whether or not such structures contain a basement; and

(b) The elevations, in relation to mean sea level, to which existing structures have been flood-proofed.

10. Variances.

(a) Review Criteria.

The development review board, after public hearing, may approve the repair, relocation, replacement or enlargement of a non-complying structure within a regulated flood hazard area, subject to compliance with applicable federal laws and regulations and provided that the following criteria are met:

i. The board finds that the repair, relocation, or enlargement of the non-complying structure is required for the continued economically feasible operation of a nonresidential enterprise;
ii. The board finds that the repair, relocation, or enlargement of the non-complying structure will not increase flood levels in the regulatory floodway, threaten the health, safety, and welfare of the public or other property owners; and,
iii. The permit so granted states that the repaired, relocated, or enlarged non-complying structure is located in a regulated flood hazard area, does not conform to the bylaws pertaining thereto, and will be maintained at the risk of the owner.

A copy of such a permit granted by the board shall be affixed to the copy of the deed of the concerned property on file in the City Clerk's office.

(b) Notice to Applicant.

The development review board shall notify the applicant that:

i. The issuance of a variance to construct a structure below the base flood elevation will result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars ($25.00) for one hundred dollars ($100.00) of insurance coverage; and
ii. Such construction below the base flood elevation increases risks of life and property.

(c) Annual Recording.
The development review board shall:
i. Maintain a record of all variance actions, including justification for their issuance; and
ii. Report such variances issued in its annual report to the administrative officer.

11. Warning of Disclaimer of Liability.

These regulations do not imply those areas outside the flood hazard area or land uses permitted within such districts will be free from flooding or flood damages. These regulations shall not create liability on the part of any city official or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made there under.

APPENDIX F – ENGLESBY BROOK STORMWATER TREATMENT SYSTEMS

O8 Pond Forebay

O8 Main Pond (Note Champlain School in Background)

SM6 Shallow Marsh Forebay

SM6 Shallow Marsh Wetland Cell1

SM6 Shallow Marsh Wetland Cell 2

Englesby Stream Channel Restoration